



Secondary design

A case of community participation

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Published in:

Proceedings of the 17th Americas Conference on Information Systems

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Recommended citation(APA):

Germonprez, M., & Hovorka, D. (2011). Secondary design: A case of community participation. In *Proceedings of the 17th Americas Conference on Information Systems : AMCIS 2011* (Vol. 3, pp. 1901-1915)
http://aisel.aisnet.org/amcis2011_submissions/212/

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8-31-2011

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Recommended Citation

Matt Germonprez and Dirk Hovorka. (2011) "Secondary design: A case of community participation" Family Business Australia (FBA): Family business research & education symposium. Perth, Australia. Aug. 2011.

http://epublications.bond.edu.au/business_pubs/506

8-6-2011

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Recommended Citation

Germonprez, Matt and Hovorka, Dirk, "Secondary Design: A Case of Community Participation" (2011). *AMCIS 2011 Proceedings - All Submissions*. Paper 212.

http://aisel.aisnet.org/amcis2011_submissions/212

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Secondary Design: A Case of Community Participation

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ABSTRACT

Online communities often rely on the loyalty and time of community members to donate energy and expertise in processes of secondary design. The focus of this paper is regarding a breakdown in the processes of secondary design at such an online community. We follow a case of change at an established online community, Digg.com. Changes in technology components by Digg administration and the effects this has had on the Digg community members affected how members contributed to processes of secondary design. This case warrants investigation as organizations are increasingly attempting to leverage online communities in the design and development of systems. The case contributes to theorizing about secondary design and communities of practice.

Keywords (Required)

Secondary Design, Communities of Practice, Qualitative Methods

INTRODUCTION

Online communities are, in part, created by participants engaged with processes of secondary design (Germonprez et al., 2009). The technology supporting online communities is initially designed with the intention of supporting, promoting, and encouraging people to contribute and negotiate the content of a system. But the technology artifact is empty and devoid of meaning without the activities of the community. Wikipedia is blank without the contributions of authors and editors. Flickr is empty without people posting and tagging images. Twitter is nothing without the tweets of millions. Online communities [herein communities] are unique in that they require the loyalty of a community willing to share their time, energy, and expertise in the ongoing co-creation of value for the parent organization and its participants.

Such communities are composed of content-contributing and content-consuming participants, collectively generating a secondarily designed system (Germonprez et al., 2009). Some communities are built around technology issues (e.g., Linux, Debian), some are built around friendships (e.g., Facebook, Twitter), and some around information (e.g., Flickr, Wikipedia, Digg, Reddit), but they are all communities participating in discourses with and through technology for the purpose of creating a joint enterprise. The structure of the community is based on supporting technology intertwined with the practices, norms and values of that community which foster belonging, friendships, debate, and understanding (Wenger, 1999).

Starting from the perspective that the technological and social components composing an online community are inseparable, and informed by theories of secondary design (Germonprez et al., 2007; 2009) and communities of practice (Wenger, 1999), we ask what happens when the system is perturbed and perceived as broken. We follow the reactions of community participants to a change in the technical configuration of a community that did not take into account the social aspects of the secondary design practices which form the foundation for participant engagement. An exploratory analysis of the reactions to the change in technical characteristics reveals the *digital wake* left behind by the community participants, the expanding zone of influence created via publically visible actions of community participants. These include comments, edits to content, admonitions to follow social norms, enforcement of community rules, and other visible actions which inform and affect the community. This analysis of the digital wake is used to examine the secondary design (Germonprez et al. 2007, 2009) and practice (Wenger, 1999) of community participants in an environment of technical and social change, leading to our primary research question: *What are the impacts of altering the primary design of an online community system currently engaged in practices of secondary design?*

PRIOR RESEARCH

Online communities are continuing to grow at an exponential rate and are becoming heavily monetized and commercially valued (Economist 2011). Rupert Murdoch purchased the social networking site MySpace, Google purchased the video site YouTube, and Conde Nast purchased the online content site Reddit. While the technology at each of these sites played an important part in their sale, so did the associated community. The communities represented a core of people designing and dedicating their cognitive surplus and their free time for creative acts for the benefit of the community and the supporting organization (Shirky, 2010). Obtaining a critical mass of participants in a community is not a simple task and is made increasingly difficult with a migrant online public. Community members switch between online marketplaces, media outlets, or social networking sites unless there is sufficient reason to establish long-term commitments to a community (Tapscott and Williams, 2006).

Online communities have been researched at multiple levels. Prior studies have examined site content to understand the phenomenon of individual loyalty and stickiness (Dikolli and Sedatole, 2007) and trust (Flavian et al. 2006). These research projects focused at the level of the individual participants and provide insight regarding how to engage individual community members. Studies of the interactions with the community include Sowe et al. (2008) who examined knowledge sharing internal to the Debian open community and Kuk (2006) who explored participant interactions within the KDE open community. In these studies, the research focus was within a successful open community, which itself focused on a specific topic. The characteristics and behavior of community and organizational interaction, considering why and how organizations leverage contributions of members have also been examined. For example, the Linux community functions with an expanding core of participants, some individual and some organizational, who are primarily interested in the development of the community artifact, the Linux kernel. Participation in the Linux open community is a leveraged, organizational model, beneficial for both the community participants and the participating organizations (Fitzgerald, 2006; Kelty, 2008).

Online Communities and Secondary Design

Ridings and Wasko (2010) investigated the structure, sociality, and sustainability of communities. They argue that, “each online discussion group is a product of its structural and social dynamics in combination, and the influence of these factors on sustainability is best understood when they are examined in relation to each other over time” (pg. 95). A community is part structural – the technology, the infrastructure, and the intentionally and technology-based support mechanisms for the community participants. A sustainable community is also part social – composed of the people, their enterprises, their engagement, and their shared repertoire (Wenger, 1999; Ridings and Wasko, 2010).

Online communities are possible through the technologies that enable them. The technical components supporting a community represent the primary design of the system, a design that has requirements specifications but does not anticipate all situations for all users (Germonprez et al., 2007). Primary design is the initial, planned design of a system, prior to implementation and engagement with people. The primary design of Wikipedia did not determine the design and development of the information dedicated to any specific topic nor the participation and negotiation of different contributors. The primary design supported the practices of linking and creating text but did not define the emergent practices associated with the design of the content on specific pages. The ongoing content and appearance of pages result from a practice of claims, negotiation, and reification that extends beyond the primary design to include the secondary design which emerges from the system in practice (Germonprez et al., 2009). Secondary design is the engagement of people with a primary design in the creation of new and evolving systems.

As people engage in secondary design, they search for meaning by participating with others in the formation of reified objects (Wenger, 1999; Germonprez et al., 2009); people negotiate meaning, socialize, learn, and design and develop their environment (Wenger, 1999; Germonprez et al., 2007). People secondarily design because they have an intrinsic motivation to create and when they join communities those creations may take the form of artifacts, content, and networks (Shirky, 2010). Community participants search for meaning as they apply their cognitive surplus in interactions with others in online communities (e.g. developing Wikipedia pages, mutually tagging photos on Flickr, or acting to align Twitter tweets) (Shirky, 2010). As members participate and create, they learn how to engage with community politics, community behavior, and the community repertoire, styles, and discourses (Wenger, 1999).

As participants of different communities, people secondarily design the space of communities to shape personal needs as well as the needs of fellow participants (Kelty, 2008). However, commitment to a particular community can fluctuate as the boundaries between communities are often porous (Wenger, 1999). People moved to Google because it provided a better search engine than the competitors of the day. People migrate as rules of participation breakdown or as the technical or social components are altered to the detriment of community participation. People can and do move quite often in the application of cognitive surplus in hopes of finding better opportunities, improved conditions, or a more comfortable location for designing

functions, content, and even themselves (Wenger, 1999). In this study we examine the conjecture that a breakdown in the ability of participants to engage in multiple secondary design practices results in negative reactions and rapid participant migration. The study contributes to academe in how we consider design (Germonprez et al. 2007) and communities (Wenger, 1999), and contributes to practices as organizations increasingly rely on public engagement in the design and evolution of systems.

We now introduce the case study of Digg. We examined changes in its primary design and the reaction of the community participants, the secondary designers. We illustrate the history leading up to the release of the Digg structural changes, the reaction of community members, and their resulting migration. Based on these observations, we then reflect on the issues of secondary design and communities of practice and consider their implications in light of our case study.

METHOD

The study investigated an issue in its real life context: a case study of participants' reactions to structural changes in the Digg.com website. In August 2010, Digg, an online news submission and voting system, released a new version of their website. By observing the changes in participant behavior resulting from changes in the available interactions participants could have with the website, we treat the case as a natural experiment (Lee, 1989) which tests prior theory of secondary design (Germonprez et al. 2007, 2009). The case sheds light on the role that community participants play in creating value through practices of secondary design and the reactions of the community when participation in that community is negatively affected.

Our approach is used to tell the story from the field, where the field is entered via the computer screen. We followed participants' collective behaviors directly related to the case: the posts and comments posted online by community participants, the public-domain posts and discussions directly addressing the structural changes to Digg, the posts from the founder of Digg, the posts from the Reddit.com management team, Twitter tweets, newly created Facebook sites, and peripheral sources of wikis, posted imagery, third party blogs, and news sites. Additionally, previous participation in the Digg community by the first author of this paper provides a background understanding of the reaction of Digg community participants and the tenor of the communication. This familiarity with the community provided first-hand access to the unfolding of the events as they happened in real time. In the case, the data is temporally ordered to provide the richest picture possible, working with nearly raw data as is the case in natural experiments. As the events unfolded, our data net widened to include information appearing beyond the boundaries of the primary community (Digg) to include both secondary (Facebook, Twitter) and tertiary (News, Blogs) communities, which reflect the broadening digital wake of events resulting from the technical change at Digg.

THE CASE OF DIGG

Digg has historically focused on providing a 'geek culture' community that shares technology-related articles. In the past few years, the types of posted articles have expanded to include world, business, and entertainment but the community participants have largely maintained the same geek culture that first participated in Digg in its early years. Participants are able to 'digg' an article if they find it interesting and by 'digging' an article, it can move to the front page of Digg.com so it is seen by a larger audience. Participants can also 'bury' an article by voting against it, thus lowering its visibility. Clicking on an article then takes participants to the comments page of the respective article (Figure 1).



Figure 1: A Digg Article's Comments Page

In the comments page, participants post reactions to articles and the reactions themselves can be ‘dugg.’ From the commenting on, submitting, and digging of articles and comments, community participants can achieve reputation within the community. As a community, Digg is relatively new and undergoing rapid expansion and multiple software versions. Created in December 2004, Digg released version 3.0 in June of 2006. During the first three versions of Digg, changes were made to the comments system, a mobile version of Digg was released, and article thumbnails were provided, but nothing that caused significant breakdowns was introduced in any of these versions. During this time, participation was steadily increasing, surpassing 1 million participants in 2007 (Arrington, 2007).

Digg began alpha testing Digg(V4) in July of 2010 and invited participants to assist with testing. With the alpha testing, a notable Digg participant posted his concerns regarding the forthcoming release of Digg(V4) and his concern for the impact they could have on how participants would interact with the site (Figure 2):

@KevinRose @Digg_community Please don't let individual content curation die out for the sake of RSS auto-fed publisher accounts. I've been telling the Digg team this since I was invited to Digg HQ to test the V4 alpha earlier this year. Publisher accounts are currently dominating Digg's front page. I completely understand the financial need to engage publishers, but without the individual-user posts that, in my opinion, made Digg a unique destination for original content, the new Digg has no more relevance than a Popurls or an Alltop (sorry, Guy), merely repeating (relinking) what everyone else is linking.

My concern is, that if Digg solely exists now to serve mainstream publishers, then it may as well be a publisher-to-publisher service, as the appeal for the individual user to visit the site will have been replaced by a constant stream of ad-supported marketing. I'm not concerned for Digg's former users, as there are plenty of other destinations for them to find unique, original content, but it saddens me to see Digg, once the best of the best destination, stray from its core competency.

Figure 2: Comments Regarding Changes from Prominent Digg Participant

The post illustrates the balance between the structural and social components that made Digg a unique participant-driven environment and a keen recognition of the value that participant secondary design provides to Digg. During the alpha tests, Digg administration remained focused on the technical components of the new version and did not demonstrate concern for the social components. This is evidenced 55 days prior to the public release of Digg(V4), when a senior infrastructure engineer at Digg, posted the following blog entry regarding Digg(V4) alpha testing (partial entry in Figure 3):

Last night we invited in our biggest batch of V4 alpha users at around 6pm. 20,000 in total. Within 20 minutes, Digg V4 was unusable. Here's what happened:

- *We have been working on an on-going problem with our backend consumers not being load balanced properly across multiple RabbitMQ servers. We have been trying to get haproxy to make this happen and in our testing, it seemed to work after numerous changes this week in alpha. Once we tried on production, not so well. We rolled this change back.*

Figure 3: Partial Comments Regarding Structural Changes at Digg

A similar, structural blog post (showing only the title for brevity) appeared by a Digg engineer 23 days prior to Digg(V4) release (Figure 4):

*Continuous Deployment, Code Review and Pre-Tested Commits on Digg4
Submitted by Andrew Bayer on July 22, 2010 - 4:06pm*

Figure 4: Additional Partial Comments Regarding Structural Changes at Digg

During the change to Digg(v4), the sole post from the Digg blog that discussed social components was by a project manager at Digg, 5 days prior to Digg(V4) release. Interestingly, the post was directed at sites providing publisher-fed content and not the longtime, individual participants of the Digg community (Figure 5):

Late last week we gave out invites to a few publishers to pass on to their readers and the response was incredible. In a short amount of time publishers such as TechCrunch added thousands of followers to their New Digg profile.

We want to see all publishers experience the same success, so we're providing every publisher, big or small, with a chance to invite their readers to the new Digg, before our GA launch. If you are a publisher, you now have 1,000 invitations to share. The invite codes will allow your readers to join the New Digg immediately and each new user will auto-follow your profile.

Click this button to generate a unique invite URL and feel free to share this on Facebook, Twitter, blog posts - everywhere and anywhere.

Figure 5: Comments Regarding Changes at Digg during Testing Stage

On August 25, 2010, Digg(V4) was released. Kevin Rose, founder of Digg, posted a blog entry introducing Digg(V4) and provided a video entry, highlighting the features of Digg(V4). The release of Digg(V4) and the resultant change in participation in the Digg community is presented around three primary issues: technical instability, feature changes, and migration and fallout of Digg participants. These three issues are presented in alignment with Germonprez et al.'s (2007) breakdowns, reflection, and action as key characteristics of secondary design.

Technical Instability: Breakdowns and Community Reflection

The community reacted to the release of Digg(V4) based on *technical instability*. Frequent representation to the 'Digg has broken an axle' message appeared regularly at Digg (Figure 6).



Figure 6: Digg Technical Instability Taken 7 Days Post Digg(V4) Release

Community participants expressed their concerns over the technical instability of Digg(V4). Tweets from Twitter illustrate the many comments on Digg(V4)'s technical instability (Figure 7):

QOT: Digg broke its 'axle' again. :-(#digg

heydavebell: @mikedavria what is up with www.digg.com? it doesn't seem to be opening for me. #diggfail

@ecosphericblog Got the new #Digg sucks. Every time I'm on it something breaks! #diggfail // #reddit Time

Bdog2g2 I guess #digg wanted to reinvent the wheel and ended up with a square. #diggfail

Figure 7: Twitter Tweets Regarding Digg Technical Instability

In light of the technical instability, the Digg vice president of engineering departed the company 13 days after the release of Digg(V4). Identifying the precise root of the structural breakdowns is difficult, however Digg(V4) did include a major change in the database backend. The database was blogged about as a major reason for the technical instability, but as posted by two Digg engineers 14 days after the release of Digg(V4), technical breakdowns occurred for a variety of reasons (Figure 8):

Engineer 1:
I can comment on this, as I work on Cassandra at Digg and an Apache Committer. No, it wasn't the sole fault of Cassandra that is causing the issues we are facing. We had other parts in our infrastructure fail, based solely on load. Did we do load testing? Yes. And we had a site running with over a million users on new.digg.com for a few months. Even with that, and load testing, when we switched over, we had even more traffic. We are writing a blog post to discuss this in depth.

Engineer 2:
The whole "Cassandra to blame" thing is 100% a result of folks clinging on to the NoSQL vs SQL thing. It's a red herring.

The new version of Digg has a whole new architecture with a bunch of technologies involved. Problem is, over the last few month or so the only technological change we mentioned (blogged about etc) was Cassandra. That made it pretty easy for folks to cling on to it as the "problem".

Really it comes down to the fact that we should have load tested better.

Figure 8: Digg Engineers Addressing Technical Instability

Whatever the precise cause, the technical instability proved to be an impetus for participants to reflect further on the Digg community. Participants were presented with a 'breakdown' of the community that resulted in continued reflection on the changes at Digg and action to respond to those changes; two key characteristics of secondary design (Germonprez et al., 2007).

Feature Changes: Breakdowns and Community Reflection

Beyond the unintentional technical instability, Digg(V4) implemented intentional *feature changes*. These included changes to the range of actions a participant could choose including *bury*, *favorites*, *friend submissions*, *upcoming pages*, *subcategories*, *profile search*, and even the symbolic *thumbs up/thumbs down* of Digg. As an example, the bury feature of Digg was used to bury stories with bad links, inappropriate content, or duplicate submissions. With Digg(V4), the bury feature was removed to prevent groups from the targeted burying of controversial or political content. As Kevin Rose's (founder of Digg) blog post explains (Figure 9):

*The bury button is gone.
By removing the bury button we have put a stop to the bury brigades. The "hide" button next to every story also acts as a "report" button, if enough people hide a story a site moderator is notified and we review it for TOS violations.*

Figure 9: Explanation of Feature Changes at Digg

Again, tweets from Twitter illustrate comments on the feature changes of the Digg(V4) and the community's displeasure, in this case, specific to the removal of the bury button feature (Figure 10):

Yourbrokenoven #Digg is officially broken. Garbage stories and spam are popping up on the front page, and there is NO bury button. Where do I get news now?

Matt_C_Johnson I need a bury button for the entire #Digg site now. Digg4 is a disastrous mess. Used to be one of my favorite sites.

hana_duel @kevinrose I dont understand some of the changes. Why no bury button? No upcoming stories section? Where can I find more ppl 2 follow? #Digg

InfoSecElmo Even Elmo doesn't like the new Digg. #digg #newdigg Elmo wants to bury it, but can't find the bury button.

Figure 10: Twitter Tweets Commenting on Digg Feature Changes

The removal of the bury button affected participants' ability to negotiate content and representations of the community. Prior to Digg(V4), the bury button was used to shape a consensus of the participants in the type of content which represented the interest of the community. With its removal, the community lost a degree of control of the secondary design of Digg.

Another feature change was *publisher-fed content*, a change in how content was contributed to Digg. The shift to include publisher-fed content limited the ability of participants to source the representational content of the community. Like removal of the bury button, the impact of publisher-fed content diminished the secondary design contributions of community members by expanding content contribution to include corporate RSS feeds. Publisher-fed content represents a change in how content is submitted and displayed on Digg. Prior to Digg(V4), the emphasis was on participant-driven content. New content was generally submitted to Digg by a participant who thought the article was of interest and value to the Digg community, not because they were personally affiliated with the item of interest. With the release of Digg(V4), participant-submitted content was still possible, but now publishers were given the ability to auto feed articles published on their corporate site (Flowers, 2010) intended to promote their own content (Figure 11).



Figure 11: Illustration of Publisher-fed RSS Feed

The inclusion of publisher-fed content altered the culture of the community to include corporate interests. Figure 12 shows 118 articles on the Digg front page five days after the release of Digg(V4), with 56% of all articles submitted via publisher-fed RSS feeds:

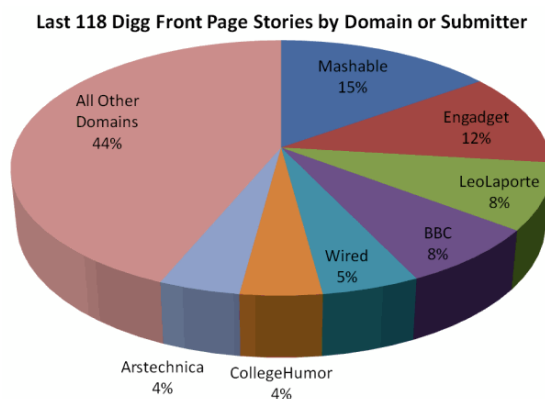


Figure 12: 118 Digg Front Page Stories by Domain or Submitter (Lardinois, 2010)

Even before the inclusion of publisher-fed content, concerns were raised by a Digg(V4) alpha-test member to not allow “individual content curation [to] die out for the sake of RSS auto-fed publisher accounts ... without the individual-user posts ... Digg [will not be] a unique destination for original content.” This feature change altered the Digg site from a repository for negotiated community interest to an automated advertising receptacle for corporations. Again, tweets from Twitter illustrate the displeasure in this change (Figure 13):

citizen_k New #digg is a glorified rss feed of tech sites. I already have one of those... At least theres still #reddit

Statik99 Digg was once the innovator, with @digg v4 now they're just a copy cat of an RSS feed. #digg will be worth zero \$ soon #diggrevolt

jeffevans62 @EvanHammond #Digg Why not just get an RSS reader and subscribe to BBC, #Mashable and #LeoLaporte? Would be the same experience.

andymci Revolt against Digg, not because Digg was ruined. It's because Digg is no longer Digg. Now it's just another RSS reader.

Figure 13: Twitter Tweets Regarding Publisher-fed Content

Symbolism and Organization: Community Action

Throughout this research secondary design is considered an engagement of people with technologies resulting in reconfigurations of system to fit variable needs and tasks. Engagement takes the form of content creation through the collective reflective action of the participants (Germonprez et al., 2009). The changes at Digg provide evidence that, as a community, Digg participants acted symbolically and in an organized manner to the changes at Digg. Figure 14 shows a comment posting on Digg written in ASCII art, a common way for participants to show images in the text-only comments fields of Digg. Submission in ASCII art is a nod to the geek culture that has defined Digg, acting as graffiti.

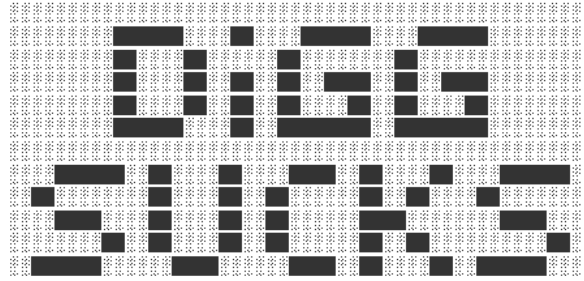


Figure 14: Symbolic ASCII Representation of Reaction to Digg(V4)

Imagery was also created to symbolize participants' view of Digg(V4). Again, an approach familiar to Digg participants was used in the symbolism. An infographic, an image common at Digg, shows participants' perspective of Digg(V4) (Figure 15). It presents corporate publishers auto-submitting via RSS feeds as the garbage truck dumping publisher-fed trash into the space historically designed by participants and future diggers as simply content scavengers, not content contributors and not secondary designers.



Figure 15: Infographic of How Participants View Digg(V4)

Digg participants also planned organized events regarding changes with Digg(V4). These events were meant to draw attention to the breakdowns in the Digg community. Organized events included 'quit Digg day' and Facebook participants created a Boycott Digg page (Figure 16).



Figure 16: Boycott Digg on Facebook

Twitter also provided an organizing mechanism for Digg participants. Digg participants created tags in the tweets to create an organized and coherent chain of messages which can be categorized and easily searched. In the following, two tags are applied to a message (#digg and #diggfail) to organize the tweet with similar comments (Figure 17):

Sample Tags: #digg; #diggfail; #digguser; #diggsucks; #newdigg

Tweet Using Tags: altitude3 have i said lately that #digg v4 sucks horribly? total #diggfail.

Figure 17: Twitter Tags Used by Digg Participants

Additional efforts to organize occurred on Digg itself. Participants undermined the Digg site by organizing all of the top stories listed at Digg to link to Reddit.com articles, a rival site to Digg. Participants protested by not digging the content of the article, but instead digging the article to move it to the top stories on Digg and drive traffic to Reddit (Figure 18).



Figure 18: Digg Top Stories All Reddit Content

Ironically, the flooding of the Digg homepage with links to a rival site (Reddit.com) (McCarthy, 2010) was reported by the very corporate RSS news feed that participants were angry about (Figure 19).



Figure 19: Digg Submission Indicating the Organized Response from Digg Participants

Migration and Fallout: Community Action

Since participants' efforts to engage secondary design were impacted, some participants left Digg and migrated to Reddit, in part due to the philosophical, technical, and social similarity between the sites. The switching costs were low with the primary effort coming from learning the language, etiquette, historicity, and general culture of Reddit (Wenger, 1999). The similarities are implied in an open letter to Kevin Rose of Digg was sent from Alexis Ohanian, founder of Reddit (Figure 20):

Kevin,
It's been a while since you cleverly debuted digg on ScreenSavers on that "Slashdot Killers" segment.

Funded by Y Combinator, Steve Huffman and I started work on reddit in June 2005, which we launched a month later. A month after that, we learned about digg and realized this was going to be an interesting new space -- we had some catching up to do.

Remember those great days? It was long before Facebook was confusing people with awkward privacy settings, before Twitter existed, and even pre-dating the "social media" industry -- back when "social media gurus" were simply called "tools."

You built a remarkably popular website with an adoring fanbase most companies can only dream of. Diggation was a brilliant decision and paved the way for Revision3, which doesn't get half of the press it deserves. In short: you were in the zone.

And we got lucky, frankly. We sold to Condé Nast in 2006, which stayed hands off, let the site keep growing, and even encouraged us to open source -- the site has grown to over 1/2 million unique visitors a day. And all of that is run by only 4 awesomesauce developers (edit: and one fantastic community manager!); I think the math comes out to 1 dev for every 2 million monthly uniques.

You chose to grow with venture capital and you've no doubt (I hope) taken some money off the table in your Series C round.

I say this because this new version of digg reeks of VC meddling. It's cobbling together features from more popular sites and departing from the core of digg, which was to "give the power back to the people."

Those are your words from that aforementioned 2004 video segment.

Now what matters is how many followers & influence a user has and how many followers & influence they've got.

Where have we heard this before: Twitter? Facebook? GoogleBuzz?

Kevin, you absolutely deserve all the credit for starting the movement -- fascinating things happen when online communities can efficiently share content. Whales get silly names and we can expose the tragedies our fellow man endures faster than ever before.

It's a damned shame to see digg just re-implementing features from other websites.

But I've got a strong feeling it's not you making these decisions anymore; and to see your baby abused like this must be awful.

This really should've been called "an open letter to digg's VCs" (but what kind of linkbait would that be?) because they really ought to **give the power back to the founder**.

All the best,
Alexis

Figure 20: Open Letter from Reddit to Digg

As seen in Figure 21 there was an increase in visits and page views at Reddit and the number of new users (n00bs by date) which corresponds to the release of Digg(v4)—an increase of nearly 200%.



Figure 21: Increased Load at Reddit.com (from Reddit.com Blog)

Figure 22 shows a corresponding drop in total US internet traffic at Digg. The percentages represent overall internet visits. In mid-August, .013% of all Internet visits were to Digg.com. In mid-September, .0086% of all Internet visits were to Digg.com—a 33% decline.

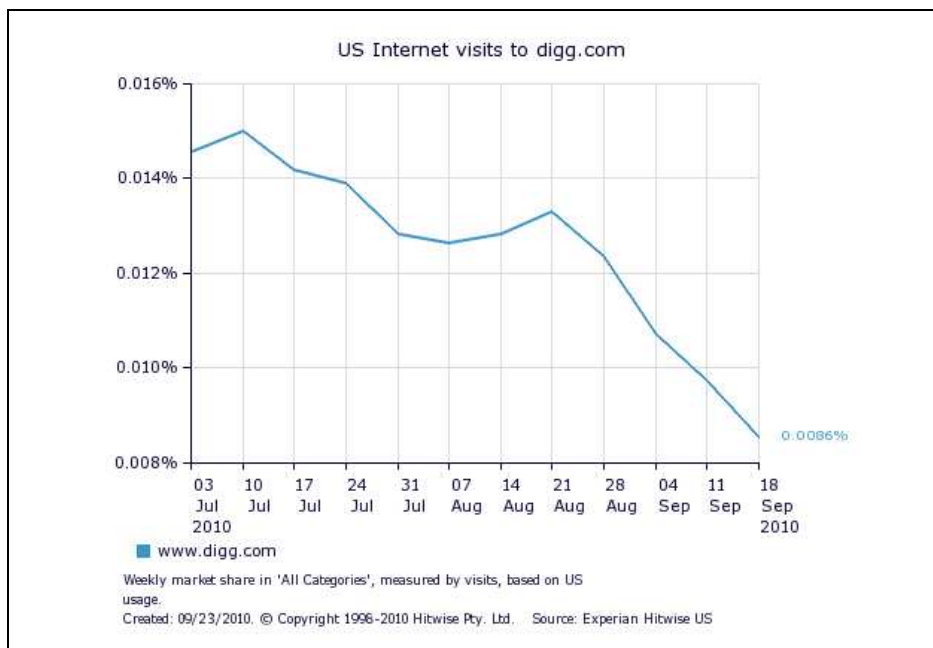


Figure 22: Decrease in Internet Visits at Digg (from Hitwise.com Blog)

We do not have evidence demonstrating that the increase in visits at Reddit (Figure 21) was caused by the same individuals who ceased visiting Digg (Figures 22). But the timing of the changes at Digg and the traffic changes at the respective sites, the philosophical similarities between Digg and Reddit, suggests that migration from Digg to Reddit occurred. Figure 23

shows the visits to Reddit by source six days following Digg(V4). Fourteen percent of visits came from Digg, including an additional 250,000 page views and 9,000 participants from the aforementioned protest of the Digg top stories pointing to Reddit (Wilhelm, 2010).

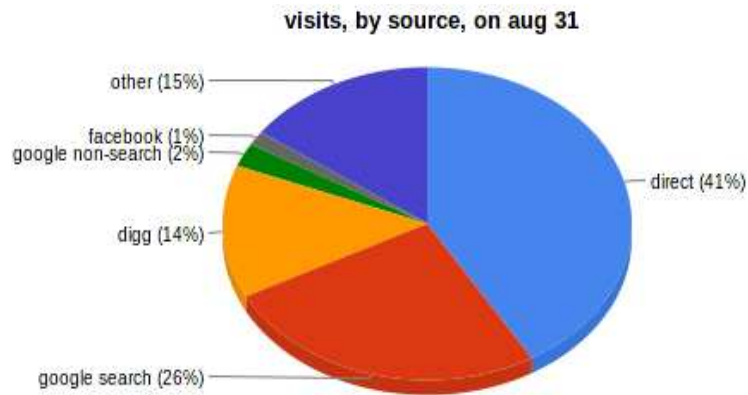


Figure 23: Visits to Reddit.com by Source: 14% from Digg

Reddit participants were also accommodating to migrating Digg members. Figure 24 shows a sampling from the Reddit community welcoming Digg participants:

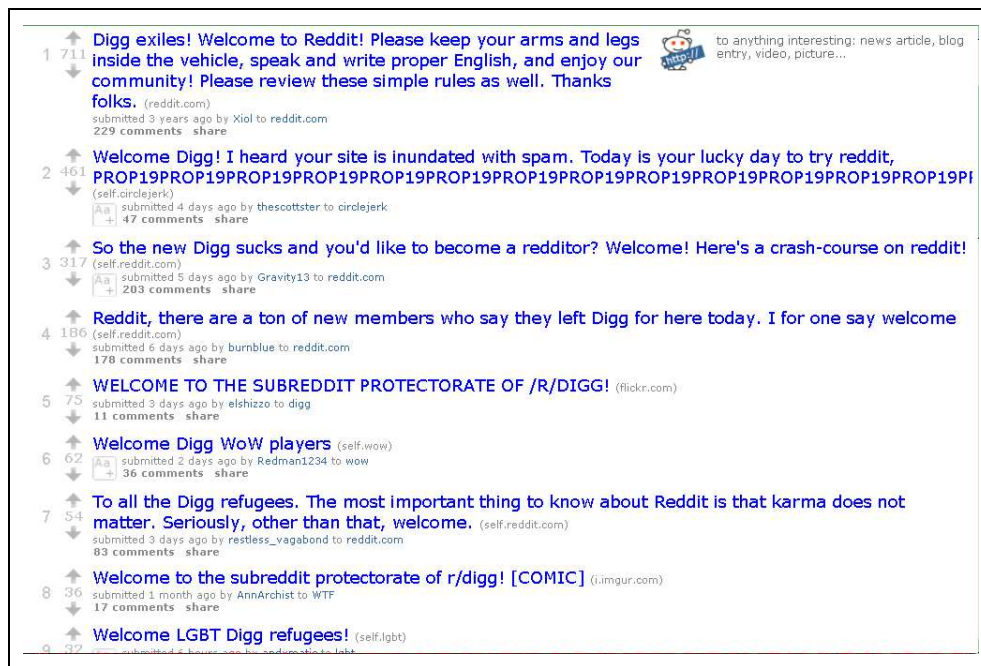


Figure 24: Welcome Messages from Reddit Participants to Former Digg Participants

We now reflect on the case and suggest implications of the case of Digg. We offer key contributions focused on secondary design and communities of practice.

DISCUSSION

The case illustrates that secondary design processes occur at the community level. Germonprez et al. (2007) originally presented secondary design as an individual, two-stage process where the system is (1) primarily designed by a designer and then (2) tailored in use by an individual. The case illustrates that, within the two-stage process, the system modification can result from a breakdown in primary design and subsequent reflection and action by a *community*. Online communities are

“social designs directed at practice” and are essential to “an organization’s competence and to the evolution of that competence” (Wenger 1999 pg. 241). Secondary design can be considered an evolutionary design process where, in our case, Digg provides a design to foster emerging community behaviors and the emerging community behaviors constitute the ongoing design of Digg (Kelty, 2009).

Secondary design is a process of reflection and action towards change, but if the process breaks down, community secondary design is inhibited and can no longer be focused on the system at hand. Wenger (1999) points to boundaries, locality, negotiation, and learning as critical parts of a community. As an organization mishandles the environment for secondary design, community members may migrate and diminish the capabilities of the community. Community participants “function best when the depth of our knowing is steeped in an identity of participation ... when we can contribute to shaping the communities that define us as knowers” (Wenger, 1999, p. 253). The case shows that technological changes have inherent risks, and risks are compounded when the value of the system to the community and to the organization relies on the cognitive surplus and secondary design of participants. Online communities inherently intertwine social and technological aspects as participants define meaning for the community, learning with other participants and building identity within the community (Wenger, 1999). A breakdown in the characteristics of the system will change the processes by which participants engage in the practice of secondary design. Because people were unable to engage with the previous community patterns to achieve meaning, learning, and identity building, they created negative content and migratory behaviors.

The case of Digg also illustrates *processes* by which secondary design occurs, not just the *principles* as in Germonprez et al. (2007). As secondary design processes extend beyond an individual with a technology, secondary design becomes subject to multi-level critique involving individuals (primary designers, individual participants), groups (Digg and Reddit communities) and organizations (Digg and Reddit organizations) (Hitt et al., 2007). In light of multi-level interactions, processes of secondary design are subject to an expanding domain of participants, impacting the ability to shape or define how those processes emerge. Primary design in Digg stems from organizational decisions of the Digg administration, a single controlling group. Secondary design in the Digg stems from the application of cognitive surplus from community members. It is a community that clearly benefits from the secondary design of members, but maintenance of a level of autocracy (administration) that can define the direction of the community. The case reinforces that information systems are composed of technical, social, and behavioral aspects and that affecting one aspect without attending to all can have negative consequences. We see that a system depends on the technological infrastructure as its primary design, but it simultaneously depends on the contributions and engagement of the members of the community who follow emergent patterns of behavior and social norms in its secondary design. Research remains to be done in this emerging area as organizations continue to engage and leverage online communities in the application of cognitive surplus and processes of secondary design.

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